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October 12, 2016

Ms. Marlene H. Dortch
Secretary
Federal Communications Commission
445 12th Street, S.W.
Washington, D.C. 20554

**Re: Written Ex Parte presentation in RM-11681; IB Docket No. 11-109; IBFS
File Nos. SES-MOD-20151231-00981, SAT-MOD-20151231-00090, and SAT-
MOD-20151231-00091**

Dear Ms. Dortch:

Aviation Spectrum Resources, Inc. ("ASRI"), by its attorney, wishes to take this opportunity to respond to the *ex parte* letter of Ligado Networks LLC filed in this proceeding dated August 22, 2016.¹ In particular, Ligado attempts to describe "significant areas of agreement between the views expressed by the aviation commenters and Ligado" regarding the protection of certified aviation receivers. *August 22 Letter* at 1. But Ligado significantly mischaracterizes the level and scope of concurrence that exists with the aviation community on this issue, while also failing to acknowledge other areas where there are still considerable disagreements at this time. Therefore, the limited level and scope of actual concurrence are not sufficient to remove the objections related to certified aviation receivers and, consequently, the Commission should not move forward with granting the pending Ligado license modifications applications at this time.²

¹ Letter of Gerald J. Waldron, Covington & Burling LLP, Counsel for Ligado, to Marlene H. Dortch, Secretary, FCC, filed in RM-16811; IB Docket No. 11-109; IBFS File Nos. SES-MOD-20151231-00981, SAT-MOD-20151231-00090, and SAT-MOD-20151231-00091 (dated August 22, 2016) ("August 22 Letter").

² The aviation parties remain open to exploring possible resolution to the remaining areas of disagreement with Ligado as sufficient information from Ligado to support meaningful dialogue becomes available.

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Ligado agrees with the aviation parties that the license modification Ligado seeks should be “subject to ‘rigorous license conditions protecting all [certified GPS] receivers operating under existing and future Minimum Operational Performance Standards (“MOPS”).’” *August 22 Letter* at 1.³ Ligado also recognizes that any license modification must “ensure[] that Ligado’s operations at all times protect certified aviation receivers operating in accordance with any MOPS incorporated into an active Technical Standard Order (‘TSO’), including legacy receivers authorized to continue operating under prior FAA TSOs.” *Id.* at 2. The aviation community will welcome these acknowledgments of objectives, but many details must still be worked out before the aviation industry, the Federal Aviation Administration (“FAA”), and the FCC can agree on detailed modifications that achieve these objectives.

These self-described “agreements” as to general objectives are not a basis for moving forward with grant of the license modifications Ligado requests. To date, no proposed specific set of regulatory and operational conditions have been proposed to articulate how these objectives will be implemented, let alone have been fully assessed by aviation to verify if they are even feasible. A subsequent Ligado *ex parte* letter dated September 8, 2016,⁴ makes some incremental progress in clarifying the picture, but the creation of a ‘standoff cylinder’ may not be feasible for some aviation operators,⁵ and many crucial elements about actual methodology of calculating and monitoring power limits for each Ligado base station still have not been

³ *Quoting* Letter from Edward A. Yorkgitis, Jr., counsel for Aviation Spectrum Resources, Inc., to Marlene H. Dortch, FCC Secretary, IB Docket No. 11-109 et al., at 2 (filed July 29, 2016) (“ASRI July 29 *Ex Parte*”)

⁴ Letter of Gerald J. Waldron, Covington & Burling LLP, Counsel for Ligado, to Marlene H. Dortch, Secretary, FCC, filed in RM-16811; IB Docket No. 11-109; IBFS File Nos. SES-MOD-20151231-00981, SAT-MOD-20151231-00090, and SAT-MOD-20151231-00091 (dated September 8, 2016) at 2 (“September 8 Letter”).

⁵ The aviation community has not yet had an adequate opportunity to fully analyze the operational impact to all airspace users from the proposals in the *September 8 Letter*. However, at this time, ASRI understand that the helicopter community does not believe that a solution that has embedded within it the creation of tens of thousands of no-fly zones in the country at low altitude is a viable solution. Many helicopter operations (particularly, air ambulance) occur at or below 500 feet where they are already at a disadvantage with regard to navigation reception and at a great exposure to flight hazards. The helicopter community requirement is to be able to operate effectively at these low altitudes with no degradation to GPS accuracy. The aviation community continues to review the information provided for a more detailed operational assessment amongst the various airspace users.

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articulated, as Ligado itself admits.⁶ Ligado expressly concedes that the FAA has not yet agreed to the Ligado conditions being proposed.⁷ The commercial aviation community will continue to review material regarding the proposed condition if it becomes available from Ligado.⁸

Ligado also states its agreement with the allied aviation parties that the active upfront and ongoing involvement of the FAA and the Commission is essential if the license modifications are to be granted. Ligado commits that “[its] operations will completely conform to the FAA’s requirements for protecting certified aviation receivers” and acknowledges that both agencies should have responsibility for “confirming the methodology by which Ligado’s compliance with this condition will be measured and assured.” *August 22 Letter* at 2-3. Again, the aviation community will welcome these statements of principle, but as noted above, many details remain lacking from Ligado’s proposals that make any claims of agreement empty.

Ligado also claims agreement with the aviation community’s proposal of “a three-phase process to be planned, agreed, and partially implemented before any grant of the Ligado

⁶ Ligado notes that its model is not approved by the FAA and that the RTCA still has not provided input into the model. *Id.*; see also *August 22 Letter* at 2 (Ligado wishes the FAA to have “an adequate opportunity to review the model and the compliance plan Ligado has proposed”). Ligado further states that “[t]he model also would include procedures for assessing the aggregate effect of the proposed base station in combination with other existing Ligado base stations in the area.” *September 8 Letter* at 2. This claim bears particular merit in light of the Ligado explanations, for the first time in the record, that it intends “to serve mission-critical Internet of Things applications and the emerging 5G market” and “expects to deploy a customized ground-based network with approximately 10,000 to 20,000 base stations — less than half as many as the coverage network proposed by Ligado’s predecessor — and many of these customized deployments would be micro sites and operate at reduced power” *Id.* at 2, 3. However, Ligado does not seek license modifications to limit its operations in this way. Accordingly, unless Ligado’s license is to be so conditioned, the Commission should analyze any proposal Ligado makes for aggregate effects and otherwise as though it were deploying a “coverage network” since either Ligado or any successor to its licenses would otherwise have the ability to do so.

⁷ *August 22 Letter* at 3; *September 8 Letter* at 2.

⁸ The aviation community is assessing the additional information provided in the *September 8 Letter*, and anticipates it may have a fuller response to what is proposed there. However, it is clear that, even assuming that the aviation community were to conclude that *Letter* may be constructive in certain respects, it is plainly clear that it would not represent a complete solution or a guarantee that one can be achieved, but no more than an incremental contribution in that direction.

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applications can take place.”⁹ Yet the process that Ligado describes is not what the aviation community has proposed, which Ligado mischaracterizes in its explanation.

While both camps agree that the first step of the process is the development of a theoretical assessment of the potential for interference, the aviation parties also proposed mandatory field testing prior to license grant to confirm the new equipment types used by Ligado can meet the theoretical models in a real world interference environment. *See ASRI August 17 Ex Parte* at 3. Ligado, however, would make this an optional requirement and does not agree that the field testing would have to be prior to license grant.¹⁰

Ligado’s proposed third phase, a site-by-site assessment, is fundamentally different than aviation’s proposal, making Ligado’s suggestion of actual agreement completely baseless. These assessment activities may be a small part of the whole implementation process of a Ligado network, but Ligado ignores the requirements for a phased rollout coordinated with aviation, while assessing any interference encountered to review the Ligado license condition if aviation safety was still affected.

Lastly, Ligado completely ignores aviation’s proposal for an agreed interference management process, clarifying what happens in the event of interference to certified GPS receivers. The aviation parties made clear that a well-defined process and responsibilities need to be established now to ensure responsive action in the event of aviation GPS interference. More specifically, if interference to aviation GPS occurs, Ligado operations in the area would need to cease immediately to rule it out as the cause. Should this not be possible, then Ligado operations would be suspended until Ligado, the FAA, the Commission, and the affected aviation parties addressed the situation and ascertained whether modifications to the prerequisites for further deployment were required. *See ASRI August 17 Ex Parte* at 3. Ligado fails to address these requirements or offer an alternative, making it clear that Ligado’s purported agreement on the three-phase process is superficial at best.¹¹

⁹ *August 22 Letter* at 3 quoting Letter from Edward A. Yorkgitis, Jr., counsel for Aviation Spectrum Resources, Inc., to Marlene H. Dortch, FCC Secretary, IB Docket No. 11-109 et al., at 2 (filed August 17, 2016) (“ASRI August 17 *Ex Parte*”).

¹⁰ Indeed, Ligado implies otherwise. *See August 22 Letter* at 4. In the formulation of the aviation parties, to be clear, only the third phase of the process as articulated by the aviation parties would occur post-grant. *See ASRI August 17 Ex Parte* at 3.

¹¹ The aviation community and Ligado do agree that RTCA should conduct an appropriately complete assessment of handset interference issues before any conclusions be made about whether to grant the license modifications. *See August 22 Letter* at 4. The

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Ligado acknowledges that it disagrees with the aviation parties about the protection of non-certified aviation receivers,¹² which are heavily relied upon by aviation.¹³ Ligado claims that all such concerns have been resolved by its analysis submitted into the record. However, the aviation industry and the GPS manufacturers with whom Ligado has reached settlements of the LightSquared-initiated federal litigation, Garmin, Trimble, and Deere (as reflected in their lengthy comments filed this summer in these proceedings) all make plain that there is *decidedly not* agreement on the interference protection criterion for non-certified devices.¹⁴ All three of the former litigants, like aviation members, look forward to the completion of the Department of Transportation's Adjacent Band Compatibility study as utilizing the correct criteria, unlike Ligado's assessments, to address the potential for interference to non-certified receivers. These results will be critical to assessing Ligado's proposal, as certified aviation receivers may not be the worst case interference model between Ligado's proposed operations and all categories of GPS receivers.

Finally, aviation's concerns about the potential for interference to satellite communications ("SATCOM") remain unaddressed, as the recent interference analysis submitted by Iridium in the record underscores.¹⁵ Notably, in its *August 22* and *September 8 Letters*, Ligado does not even mention Iridium and the concerns about harmful interference to SATCOM that Iridium has raised *and substantiated*.

To put it simply, Ligado proposes the Commission proceed on an issue affecting multiple aviation safety systems based on an intent and generic plans with little specifics. Commercial aviation would not make a safety decision on such information, and nor would the flying public expect them to do so. Accordingly, until the issues raised herein and in the earlier comments and

RTCA review must be conducted over a sufficient period to provide it and its constituent members an adequate opportunity for review and deliberation.

¹² See *August 22 Letter* at 5.

¹³ See Comments of ASRI *et al.*, filed in IB Docket No. 11-109 on May 23, 2016, at 15 ("Joint Aviation Parties Comments"); Reply Comments of ASRI *et al.*, filed in IB Docket No. 11-109 on June 21, 2016, at 13 & n. 30.

¹⁴ Of the many outstanding questions on the Roberson and Associates testing report, ASRI would especially note that Ligado has continually failed to respond to questions the aviation community has raised on how Ligado assesses the performance of a GPS receiver's velocity or timing functions. See *Joint Aviation Parties Comments* at 15.

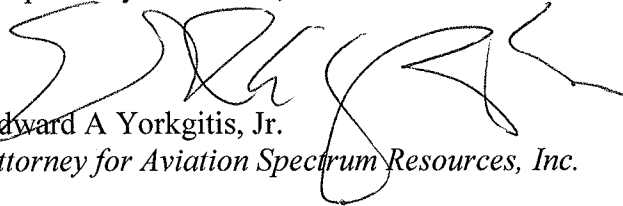
¹⁵ See "Technical Analysis of Ligado Interference Impact on Iridium User Links," appended to Letter of Bryan Tramont, Wilkinson Barker & Knauer LLP, Counsel for Iridium, filed in Docket No. IB 11-109, dated September 1, 2016.

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reply comments filed by the aviation parties are addressed and resolved, the Commission should not grant the Ligado modification applications.

Respectfully Submitted,



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